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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/757,584 | 01/15/2004 | Takatoshi Ono | 2004_0043A | 4927 |

52349 7590 07/25/2008

WENDEROTH, LIND & PONACK L.L.P.
2033 K. STREET, NW
SUITE 800
WASHINGTON, DC 20006

| EXAMINER | |
|---|---|
| BODDIE, WILLIAM | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2629 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 07/25/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/757,584 | ONO ET AL. | |
| | Examiner | Art Unit | |
| | WILLIAM L. BODDIE | 2629 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *22 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *29-58* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29-58* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. In an amendment dated, April 22nd 2008, the Applicants amended claims 29, 41 and 44. Currently claims 29-58 are pending.

### *Response to Arguments*

2. Applicant's arguments with respect to claims 29 – 54 and 56-58 have been fully considered but are not persuasive.

3. On page 10 of the Remarks, the Applicant's argue that neither Houston nor Eleyan disclose electromagnets that support the sphere from below. The Examiner must respectfully disagree.

4. It should first be noted that the current claims do not require that the electromagnet also form the support as has been stated in the Remarks. Furthermore, Eleyan discloses three supports that support the sphere from below. While true Houston does disclose that the electromagnet supports the sphere from above in figure 19, the electromagnet still supports the sphere. The physical location of Eleyan's electromagnets upon replacement with Houston's electromagnet would result in the sphere being supported from below by the electromagnets.

5. On pages 11-12 of the Remarks, the Applicant's argue that Eleyan teaches away from the proposed combination. Specifically the Applicants point to Eleyan's functionality to pull the sphere in a rotational direction. The Examiner must respectfully disagree.

6. The functionality of Eleyan pulling the sphere in a direction would certainly be possible with a plurality of Houston electromagnets. To further explain the combination,

it is not to replace the plurality of electromagnets of Eleyan with a single electromagnet in the shape of Houston. It would seem more clear that the plurality of Eleyan electromagnets would be replaced with a plurality of Houston electromagnets. Such a combination would still allow for the functionality disclosed in Eleyan.

7. Applicant's arguments, with respect to the rejection(s) of claim(s) 55 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Lenssen et al. (US 5,831,553) and Hosogoe et al. (US 4,581,609).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 29-30, 33-34, 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Houston (US 5,168,221).

**With respect to claim 29,** Eleyan discloses, a trackball device (fig. 13) comprising:

a sphere (200 in fig. 13) including magnetic material (col. 8, lines 6-9);

a support rotatably supporting said sphere from below (36, 94 in figs. 13-14), said support including a first, second (94 in fig. 14), and third supporting member (36 in fig. 13-14) arranged in contact with said sphere at respectively spaced apart locations

below said sphere such that said sphere rests on said first, second and third supporting members (36 in fig. 13; for example);

a rotation detector configured to detect rotation of said sphere (94 in fig. 14) and output a signal indicating rotation of said sphere (dashed boxes in fig. 14; col. 1, lines 38-41; col. 5, lines 2-3);

a controller operably coupled to said rotation detector and being configured to generate a specific output signal responsive to a signal from said rotation detector indicating rotation of said sphere (col. 9, lines 49-58); and

an informer (106 in fig. 13-14) including an electromagnet (a-j in fig. 13);

wherein said sphere is disposed in a magnetic flux circuit generated by said electromagnet, and

wherein said informer is operable to change a friction force of said sphere with respect to said support by causing said electromagnet to generate a magnetic attractive force to attract said sphere (col. 8, lines 40-54) to said first and second supporting members (fig. 13) based on said specific output signal from said controller (col. 9, lines 56-57).

Eleyan does not expressly disclose that the magnetic flux of said magnetic flux circuit goes from said electromagnet through said first supporting member, said sphere, and said second supporting member, and returns to said electromagnet, with said sphere being located in said magnetic flux circuit between said first and second supporting members.

Houston discloses, a magnetic flux circuit (fig. 19) wherein the magnetic flux of said magnetic flux circuit goes from an electromagnet (124 in fig. 19) through a first supporting member (N member in fig. 19), said sphere (122 in fig. 19), and said second supporting member (S member in fig. 19), and returns to said electromagnet, with said sphere being located in said magnetic flux circuit between said first and second supporting members (fig. 19).

Houston and Eleyan are analogous art because they are both from the same field of endeavor namely feedback circuitry for cursor control devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the electromagnets of Eleyan with the electromagnet of Houston.

The motivation for doing so would have been to by allowing a varying amount of current to effectively lock the ball in place and apply stronger feedback forces (Houston; col. 13, lines 42-51).

To clarify the rejection, upon the replacement of Eleyan's electromagnets with those taught by Houston, the first and second supports of Houston will support the sphere of Eleyan in concert with the third support of Eleyan.

**With respect to claim 30,** Eleyan and Houston discloses, the trackball device of claim 29 (see above).

Eleyan, when combined with Houston, discloses, wherein said electromagnet has a core with first and second ends (Houston; N and S member in fig. 19); and wherein said first supporting member is coupled to said first end of said core (Houston; N member in fig. 19), said second supporting member is coupled to said second end of

said core (Houston; S member in fig. 19), and said third supporting member is independent of said core (Eleyan; 94 in fig. 13).

**With respect to claims 33-34,** Eleyan and Houston discloses, the trackball device of claims 29 and 30 (see above).

Eleyan, when combined with Houston, further discloses, wherein a direction of the magnetic flux generated by the electromagnet is alternately switched (Eleyan; col. 8, lines 36-44).

**With respect to claim 56,** Eleyan and Houston disclose, the trackball device of claim 29 (see above).

Eleyan, when combined with Houston, discloses, wherein said first, second and third supporting members support said sphere at three locations disposed equiangularly (Upon combining Eleyan with Houston, 106 in fig. 14 will be replaced with the electromagnet of Houston; from this it should be clear that the first and second members of Houston would be disposed equiangular with a third support 94 of Eleyan).

10. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Houston (US 5,168,221) further in view of Yokoji et al. (US 6,909,422).

**With respect to claim 31,** Houston and Eleyan disclose, the trackball device of claim 30 (see above).

Neither Houston nor Eleyan disclose that the sphere and the supporting members are made from the same material.

Yokoji discloses, a trackball with a sphere (308 in fig. 19) and supporting members (326a, 325a in fig. 19) who are all formed from with an elastic surface material (col. 7, lines 60-65; col. 21, lines 42-46).

Yokoji, Houston and Eleyan are all analogous art because they are all from the same field of endeavor namely, rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to coat the surface of the sphere and support elements of Eleyan and Houston with the with the same elastic material taught by Yokoji.

The motivation for doing so would have been to obtain an easy-to-manipulate track ball (Yokoji; col. 7, lines 63-65).

11. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Houston (US 5,168,221) and further in view of Mailey et al. (US 5,237,311).

**With respect to claim 32,** Houston and Eleyan disclose, the trackball device of claim 30 (see above).

Neither Houston nor Eleyan disclose, a switch operated by depression of the sphere.

Mailey discloses, the inclusion of a switch (b in fig. 1), which is operated by depression of a sphere (10 in fig. 1) in relation with a third supporting member (42 in fig. 1; also note the abstract discussion of the transducer), wherein a controller is operable to detect a state of said switch (clear from fig. 1).

Mailey, Houston and Eleyan are all analogous art because they are all from the same field of endeavor namely, rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the third supporting member of Eleyan and Houston with the switch controlling support member taught by Mailey.

The motivation for doing so would have been, the elimination of awkward finger movements to actuate a switch (Mailey; col. 2, lines 5-9).

12. Claims 35, 37 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Houston (US 5,168,221) and further in view of Mimlitch et al. (US 5,171,978).

**With respect to claim 35,** Eleyan and Houston disclose, the trackball device of claim 29 (see above).

Neither Houston nor Eleyan expressly disclose, wherein a permanent magnet configured to have a magnetic field that influences said sphere so as to force said support against said sphere.

Mimlitch discloses, a trackball device (fig. 1), wherein a permanent magnet (45 in fig. 1) is configured to have a magnetic field that influences a sphere (11 in fig. 1) so as to force a support (49 in fig. 1) against the sphere (col. 5, lines 58-60).

Mimlitch, Houston and Eleyan are analogous art because they are both from the same field of endeavor namely, trackball devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the permanent magnet of Mimlitch in the trackball device of Eleyan and Houston.

The motivation for doing so would have been to simplify manufacture and reduce wear of the device (Mimlitch; col. 1, lines 25-59) and ensure contact between the ball and the rollers.

**With respect to claim 37,** Eleyan, Houston and Mimlitch disclose, the trackball device of claim 35 (see above).

Eleyan, when combined with Houston and Mimlitch, discloses, wherein said first supporting member is coupled to said first end of said core (Houston; N member in fig. 19), said second supporting member is coupled to said second end of said core (Houston; S member in fig. 19), and said third supporting member is independent of said core (Eleyan; 94 in fig. 13).

**With respect to claim 40,** Eleyan, Houston and Mimlitch disclose, the trackball device of claim 35 (see above).

Eleyan further discloses, when combined with Houston and Mimlitch, wherein said controller is operable to switch alternately a direction of the magnetic flux generated by the electromagnet (Eleyan; col. 8, lines 36-44).

13. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Houston (US 5,168,221) and further in view of Mimlitch et al. (US 5,171,978) and Tuovinen et al. (US 6,509,888).

**With respect to claim 36,** Eleyan, Houston and Mimlitch disclose, the trackball device of claim 35 (see above).

Neither Eleyan, Houston nor Mimlitch expressly disclose, that the permanent magnet is located so that a direction of magnetic lines generated by said permanent magnet coincides with a direction of magnetic lines generated by said electromagnet.

Tuovinen discloses, a roller input device (fig. 12b) wherein a permanent magnet (6 in fig. 1a) is located so that a direction of magnet lines (m in fig. 1a) generated by said permanent magnet coincide with a direction of magnetic lines generated by an electromagnet (41 in fig. 12b).

Tuovinen, Mimlitch, Houston and Eleyan are analogous art because they are both from the same field of endeavor namely, rotatable magnetic input devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to orient the permanent magnet of Mimlitch, Houston and Eleyan in the same direction as the electromagnet, as taught by Tuovinen.

The motivation for doing so would have been to not inadvertently counteract any feedback generated by said informer, thereby ensuring the maximum amount of feedback to the user possible.

14. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Houston (US 5,168,221) and further in view of Mimlitch et al. (US 5,171,978) and Yokoji et al. (US 6,909,422).

**With respect to claim 38,** Houston, Mimlitch and Eleyan disclose, the trackball device of claim 37 (see above).

Neither Houston, Mimlitch nor Eleyan disclose that the sphere and the supporting members are made from the same material.

Yokoji discloses, a trackball with a sphere (308 in fig. 19) and supporting members (326a, 325a in fig. 19) who are all formed from with an elastic surface material (col. 7, lines 60-65; col. 21, lines 42-46).

Yokoji, Houston, Mimlitch and Eleyan are all analogous art because they are all from the same field of endeavor namely, rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to coat the surface of the sphere and support elements of Eleyan, Mimlitch and Houston with the same elastic material taught by Yokoji.

The motivation for doing so would have been to obtain an easy-to-manipulate track ball (Yokoji; col. 7, lines 63-65).

15. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Houston (US 5,168,221) and further in view of Mimlitch et al. (US 5,171,978) and Mailey et al. (US 5,237,311).

**With respect to claim 39,** Eleyan, Mimlitch and Houston disclose the trackball device of claim 37 (see above).

Neither Mimlitch, Houston nor Eleyan expressly disclose, at least one switch disposed around said trackball device.

Mailey discloses, the inclusion of a switch (b in fig. 1), which is operated by depression of a sphere (10 in fig. 1) in relation with a third supporting member (42 in fig. 1; also note the abstract discussion of the transducer).

Mailey, Mimlitch, Houston and Eleyan are analogous art because they are all from the same field of endeavor namely, rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the third supporting member of Mimlitch, Houston and Eleyan with the switch controlling support member of Mailey.

The motivation for doing so would have been to eliminate awkward finger movements to actuate a switch (Mailey; col. 2, lines 5-9).

16. Claims 41-42 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Houston (US 5,168,221) and further in view of Bruneau et al. (US 2002/0054011).

**With respect to claim 41,** Eleyan discloses, an input device comprising,

a trackball device (fig. 13), and

a sphere (200 in fig. 13) including magnetic material (col. 8, lines 6-9);

a support rotatably supporting said sphere from below (36, 94 in figs. 13-14), said support including a first, second (94 in fig. 13-14) and third supporting members (36 in fig. 13-14) arranged in contact with said sphere at respectively spaced apart locations (36 in fig. 13; for example) below said sphere such that said sphere rests on said first, second and third supporting members (36 in fig. 13; for example);

a rotation detector configured to detect rotation of said sphere (94 in fig. 14) and output a signal indicating rotation of said sphere (dashed boxes in fig. 14; col. 1, lines 38-41; col. 5, lines 2-3);

a controller operably coupled to said rotation detector and being configured to generate a specific output signal responsive to a signal from said rotation detector indicating rotation of said sphere (col. 9, lines 49-58); and

an informer (106 in fig. 13-14) including an electromagnet (a-j in fig. 13);

wherein said sphere is disposed in a magnetic flux circuit generated by said electromagnet, and

wherein said informer is operable to change a friction force of said sphere with respect to said support by causing said electromagnet to generate a magnetic attractive force to attract said sphere (col. 8, lines 40-54) to said first and second supporting members (fig. 13) based on said specific output signal from said controller (col. 9, lines 56-57).

Eleyan does not expressly disclose that the magnetic flux of said magnetic flux circuit goes from said electromagnet through said first supporting member, said sphere, and said second supporting member, and returns to said electromagnet, with said sphere being located in said magnetic flux circuit between said first and second supporting members.

Houston discloses, a magnetic flux circuit (fig. 19) wherein the magnetic flux of said magnetic flux circuit goes from an electromagnet (124 in fig. 19) through a first supporting member (N member in fig. 19), said sphere (122 in fig. 19), and said second supporting member (S member in fig. 19), and returns to said electromagnet, with said sphere being located in said magnetic flux circuit between said first and second supporting members (fig. 19).

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the electromagnets of Eleyan with the electromagnet of Houston.

The motivation for doing so would have been to by allowing a varying amount of current to effectively lock the ball in place and apply stronger feedback forces (Houston; col. 13, lines 42-51).

Neither Eleyan nor Houston expressly disclose, at least one switch disposed around said trackball device.

Bruneau discloses, an input device comprising:

a trackball device (fig. 2) comprising:

at least a first switch disposed around the trackball device (16a/b in fig. 1);

a sphere (15 in fig. 2);

a support for rotatably supporting the sphere (52,40 in fig. 2);

a rotation detector for detecting rotation of the sphere (54 in fig. 2);

a controller for generating a specific output signal responsive to a signal from the rotation detector (210 in fig. 5); and

an informer (148, 150, 18) for generating auxiliary information responsive to rotating of the sphere, the auxiliary information being based on the signal from the controller (para. 11).

Bruneau, Houston and Eleyan are analogous art because they are all from the same field of endeavor namely, electromagnetic feedback devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the switches, taught by Bruneau, around the trackball device of Eleyan and Houston.

The motivation for doing so would have been to allow the user to provide additional commands to a computer system (Bruneau; col. 4, lines 12-15).

**With respect to claim 42,** Eleyan, Houston and Bruneau disclose, the trackball device of claim 41 (see above).

Eleyan, when combined with Houston and Bruneau, discloses, wherein said electromagnet has a core with first and second ends (Houston; N and S member in fig. 19); and

wherein said first supporting member is coupled to said first end of said core (Houston; N member in fig. 19), said second supporting member is coupled to said second end of said core (Houston; S member in fig. 19), and said third supporting member is independent of said core (Eleyan; 94 in fig. 13).

**With respect to claim 57,** Eleyan and Houston disclose, the trackball device of claim 41 (see above).

Eleyan, when combined with Houston, discloses, wherein said first, second and third supporting members support said sphere at three locations disposed equiangularly (Upon combining Eleyan with Houston, 106 in fig. 14 will be replaced with the electromagnet of Houston; from this it should be clear that the first and second members of Houston would be disposed equiangular with a third support 94 of Eleyan).

17. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Houston (US 5,168,221) and further in view of Bruneau et al. (US 2002/0054011) and Mimlitch et al. (US 5,171,978).

**With respect to claim 43,** Eleyan, Houston and Bruneau discloses, the trackball device of claim 41 (see above).

Neither Bruneau, Houston nor Eleyan expressly disclose, wherein a permanent magnet configured to have a magnetic field that influences said sphere so as to force said support against said sphere.

Mimlitch discloses, a trackball device (fig. 1), wherein a permanent magnet (45 in fig. 1) is configured to have a magnetic field that influences a sphere (11 in fig. 1) so as to force a support (49 in fig. 1) against the sphere (col. 5, lines 58-60).

Mimlitch, Bruneau, Houston and Eleyan are analogous art because they are both from the same field of endeavor namely, trackball devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the permanent magnet of Mimlitch in the trackball device of Eleyan, Houston and Bruneau.

The motivation for doing so would have been to simplify manufacture and reduce wear of the device (Mimlitch; col. 1, lines 25-59) and ensure contact between the ball and the rollers.

18. Claims 44-49 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Houston (US 5,168,221) and further in view of Ideno (JP 64-24447).

**With respect to claim 44,** Eleyan discloses, a trackball device (fig. 13) comprising:

a sphere (200 in fig. 13) including magnetic material (col. 8, lines 6-9);

a support rotatably supporting said sphere from below (36, 94 in figs. 13-14), said support including a first, second (94 in fig. 13-14) and third supporting members (36 in fig. 13-14) arranged in contact with said sphere at respectively spaced apart locations (36 in fig. 13; for example) below said sphere such that said sphere rests on said first, second and third supporting members (36 in fig. 13; for example);

a rotation detector configured to detect rotation of said sphere (94 in fig. 14) and output a signal indicating rotation of said sphere (dashed boxes in fig. 14; col. 1, lines 38-41; col. 5, lines 2-3);

a controller operably coupled to said rotation detector and being configured to generate a specific output signal responsive to a signal from said rotation detector indicating rotation of said sphere (col. 9, lines 49-58); and

an informer (106 in fig. 13-14) including an electromagnet (a-j in fig. 13);

wherein said sphere is disposed in a magnetic flux circuit generated by said electromagnet, and

wherein said informer is operable to change a friction force of said sphere with respect to said support by causing said electromagnet to generate a magnetic attractive force to attract said sphere (col. 8, lines 40-54) to said first and second supporting members (fig. 13) based on said specific output signal from said controller (col. 9, lines 56-57).

Eleyan does not expressly disclose that the magnetic flux of said magnetic flux circuit goes from said electromagnet through said first supporting member, said sphere, and said second supporting member, and returns to said electromagnet, with said sphere being located in said magnetic flux circuit between said first and second supporting members.

Houston discloses, a magnetic flux circuit (fig. 19) wherein the magnetic flux of said magnetic flux circuit goes from an electromagnet (124 in fig. 19) through a first supporting member (N member in fig. 19), said sphere (122 in fig. 19), and said second supporting member (S member in fig. 19), and returns to said electromagnet, with said sphere being located in said magnetic flux circuit between said first and second supporting members (fig. 19).

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the electromagnets of Eleyan with the electromagnet of Houston.

The motivation for doing so would have been to by allowing a varying amount of current to effectively lock the ball in place and apply stronger feedback forces (Houston; col. 13, lines 42-51).

Neither Houston nor Eleyan expressly disclose, providing a trackball device in a vehicle cabin.

Ideno discloses, a vehicle comprising:

a vehicle body having a vehicle cabin therein (fig. 1);

a drive wheel supporting the vehicle body (the inclusion of a drive wheel is inherent in the design of a vehicle); and

a trackball device provide in the vehicle cabin (2 in fig. 1).

Ideno and Eleyan are analogous art because they are both from the same field of endeavor namely the design and operation of rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use the trackball device of Eleyan in a vehicle as taught by Ideno.

The motivation for doing so would have been to enhance the interaction between drivers and the onboard computer system (Eleyan; col. 2, lines 50-53).

**With respect to claim 45,** Eleyan and Ideno disclose, the vehicle of claim 44 (see above).

Eleyan, when combined with Houston and Ideno, discloses, wherein said electromagnet has a core with first and second ends (Houston; N and S member in fig. 19); and

wherein said first supporting member is coupled to said first end of said core (Houston; N member in fig. 19), said second supporting member is coupled to said second end of said core (Houston; S member in fig. 19), and said third supporting member is independent of said core (Eleyan; 94 in fig. 13).

**With respect to claim 46,** Eleyan, Houston and Ideno disclose, the vehicle of claim 44 (see above).

Eleyan further discloses, a second controller (42 in fig. 2) configured to receive the signal from said first controller (clear from fig. 2); and

electronic equipment configured to be controlled by said second controller (46 in fig. 2).

**With respect to claim 47,** Eleyan, Houston and Ideno disclose, the vehicle of claim 44 (see above).

Eleyan further discloses, wherein said electronic equipment includes a display (46 in fig. 2) for displaying a cursor (44 in fig. 2), and rotation of said sphere causes movement of the cursor on the display (col. 4, lines 1-13).

**With respect to claim 48,** Eleyan, Houston and Ideno disclose, the vehicle of claim 44 (see above).

Ideno further discloses, wherein said trackball device is disposed in a central position of a full width of said vehicle cabin (clear from figs. 1 and 4).

**With respect to claim 49,** Eleyan, Houston and Ideno disclose, the vehicle of claim 44 (see above).

Ideno further discloses, two seats in a front portion of said vehicle cabin, wherein said trackball device is disposed between said two seats (once again this is clear from figs. 1 and 4).

**With respect to claim 58,** Eleyan, Ideno and Houston disclose, the trackball device of claim 44 (see above).

Eleyan, when combined with Houston and Ideno, discloses, wherein said first, second and third supporting members support said sphere at three locations disposed equiangularly (Upon combining Eleyan with Houston, 106 in fig. 14 will be replaced with the electromagnet of Houston; from this it should be clear that the first and second members of Houston would be disposed equiangular with a third support 94 of Eleyan).

19. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Houston (US 5,168,221) and further in view of Ideno (JP 64-24447) and Mimlitch et al. (US 5,171,978).

**With respect to claim 50,** Eleyan, Houston and Ideno disclose, the vehicle of claim 44 (see above).

Neither Ideno, Houston nor Eleyan expressly disclose, wherein a permanent magnet configured to have a magnetic field that influences said sphere so as to force said support against said sphere.

Mimlitch discloses, a trackball device (fig. 1), wherein a permanent magnet (45 in fig. 1) is configured to have a magnetic field that influences a sphere (11 in fig. 1) so as to force a support (49 in fig. 1) against the sphere (col. 5, lines 58-60).

Mimlitch, Ideno, Houston and Eleyan are analogous art because they are both from the same field of endeavor namely, trackball devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the permanent magnet of Mimlitch in the trackball device of Eleyan, Houston and Ideno.

The motivation for doing so would have been to simplify manufacture and reduce wear of the device (Mimlitch; col. 1, lines 25-59) and ensure contact between the ball and the rollers.

**With respect to claim 51,** Eleyan, Houston, Mimlitch and Ideno disclose, the vehicle of claim 50 (see above).

Eleyan further discloses, a second controller (42 in fig. 2) configured to receive the signal from said first controller (clear from fig. 2); and

electronic equipment configured to be controlled by said second controller (46 in fig. 2).

**With respect to claim 52,** Eleyan, Houston, Mimlitch and Ideno disclose, the vehicle of claim 50 (see above).

Eleyan further discloses, wherein said electronic equipment includes a display (46 in fig. 2) for displaying a cursor (44 in fig. 2), and rotation of said sphere causes movement of the cursor on the display (col. 4, lines 1-13).

**With respect to claim 53,** Eleyan, Houston, Mimlitch and Ideno disclose, the vehicle of claim 50 (see above).

Ideno further discloses, wherein said trackball device is disposed in a central position of a full width of said vehicle cabin (clear from figs. 1 and 4).

**With respect to claim 54,** Eleyan, Houston, Mimlitch and Ideno disclose, the vehicle of claim 50 (see above).

Ideno further discloses, two seats in a front portion of said vehicle cabin, wherein said trackball device is disposed between said two seats (once again this is clear from figs. 1 and 4).

20. Claim 55 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hosogoe et al. (US 4,581,609) in view of Noguchi et al. (US 5,639,168) and further in view of Lenssen et al. (US 5,831,553).

**With respect to claim 55,** Hosogoe discloses, a trackball device (fig. 3) comprising:

a sphere (5 in fig. 3) consisting of steel (col. 3, lines 41-45);

a support configured to rotatably support said sphere (30 in fig. 5);

a rotation detector configured to detect rotation of said sphere (20 and 21 in fig. 5; col. 4, lines 12-13);

a controller configured to generate a specific output signal responsive to a signal from said rotation detector (25 and 26 in fig. 5; col. 4, lines 19-34).

Hosogoe does not expressly disclose that the sphere is formed of one of martensite stainless steel and ferrite stainless steel.

Noguchi discloses, forming ball bearings out of martensite stainless steel (claim 9 for example).

Noguchi and Eleyan are analogous art because they are both from the same field of endeavor namely the design and manufacturing small metallic spheres.

At the time of the invention it would have been obvious to one of ordinary skill in the art to construct the sphere of Eleyan out of martensite stainless steel as taught by Noguchi for the benefit of martensite's high corrosion-resistance (Noguchi; col. 1, lines 60-62).

Neither Noguchi nor Eleyan expressly disclose an informer or a magnetic flux circuit.

Lenssen discloses, an informer (702, 704 in fig. 7) including an electromagnet (702 in fig. 7), and being configured to generate auxiliary information responsive to

rotating of said sphere, the auxiliary information being based on the signal from said controller (col. 6, lines 4-56);

wherein said sphere is disposed in a magnetic flux circuit generated by said electromagnet, and said informer is operable to generate the auxiliary information by causing said electromagnet to generate a magnetic attractive force to influence said sphere (col. 6, lines 24-34).

Lenssen, Noguchi and Eleyan are analogous art because they are both from the same field of endeavor namely the design and manufacturing small metallic spheres.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the informer and flux circuit of Lenssen in the trackball of Eleyan and Noguchi.

The motivation for doing so would have been to assist the user to control a cursor on a display screen (Lenssen; col. 6, lines 15-18).

***Conclusion***

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM L. BODDIE whose telephone number is (571)272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Sumati Lefkowitz/
Supervisory Patent Examiner, Art Unit 2629

/William L Boddie/
Examiner, Art Unit 2629
7/18/08